Appendix A: Special Species of the Loess Hills

This appendix lists the large number of Loess Hills species that are distinguished by their patterns of distribution or rarity. The landform's large amount of remaining natural habitat constitutes a fertile biological crossroads for species of eastern deciduous forests and western mixed-grass prairies, many of which reach their farthest outposts in or close to the Loess Hills.

Twelve animals and 28 plants are near the western edge of their distribution range in the Hills. These eastern deciduous forest species are found in the moister forested areas of the Loess Hills and extend their range a short distance farther west into Nebraska.

A similar number of organisms (28 vascular plants; 8 animals, mostly reptiles and amphibians), nearly all of which are prairie species, stretch their ranges eastward just into western Iowa. About a third of these are restricted in Iowa to the Loess Hills. These species (for example soapweed and skeletonweed) are classic indicators of Loess Hills dry mid-grass prairies. They are joined by rusts and other fungi and by soil lichens that are typical of western arid regions.

Western species demonstrate numerous adaptations that allow them to thrive in the harsh, desert-like environment of Loess Hills prairies. Many animals spend sunny days underground in burrows. The plains spadefoot toad, with a center of distribution in our nation's southwestern deserts, carries this trait to an extreme. The toad comes to the ground surface for only a few weeks each spring to complete its breeding cycle. The plains pocket mouse, a relative of the desert-dwelling kangaroo rat, can manufacture its required water entirely from the food it eats. Although its largest populations exist in the Loess Hills, this western mouse also is found sporadically to the east of the Hills on dry loess and sandy soils.

Western plants display numerous traits that aid in preventing desiccation – low stature, small leaves, thick waxy cuticles, reflective silvery surface hairs, and deep roots. The leaves of skeletonweed, for example, have been reduced to mere slivers, while soapweed stores water in its fleshy silver-green leaves. Forty-foot-deep roots have been measured in loess soils for soapweed, a plant that rarely exceeds 4 feet in height.

Western species extending into the Loess Hills exhibit unusual distribution patterns. Many, like soapweed, seem to have migrated along the Missouri River's dry bluffs and sand dunes and today extend from the Great Plains eastward into the Loess Hills along a long, thin corridor that follows this river's course. Others, such as cowboy's delight, are truly disjunct species that are separated from larger populations by a hundred miles or more. These are likely to be relicts of populations that were widespread long ago when hot, dry climates nudged western prairie communities eastward.

Table A-1 lists the special species and their distribution among Special Landscape Areas of the Loess Hills. Special Landscape Areas are described in Appendix D.

Table A-1: Special Species

					Special Landscapes ³											
Common Name	Scientific Name	Habitat	Affinity [†]	Official lowa Status ²	Plymouth North	Plymouth South	Luton	Grant Center	Turin	State Forest	Mondamin	Loveland	Council Bluffs	Folsom Point	Burr Oak	Waubonsie
BUTTERFLIES																
Arogos skipper	Atrytone arogos	prairies	W	S		D										
Dusted skipper	Atrytonopsis hianna	prairies		S	D	D	Р	Р	Р	D	Р	D	Р	D	P	Ν
Wild indigo duskywing	Erynnis baptisiae	prairies	E	S		Ν	Р	Р	D							
Sleepy duskywing	Erynnis brizo	woodlands	Е	S											D	
Olympia marble	Euchloe olympia	prairies		S	D	D	Р	Р	Р	D	Р	Р	Р	Р	Р	D
Zebra swallowtail	Eurytides marcellus	woodlands	Е	S												D
Leonard's skipper	Hesperia leonardus	prairies		S	D	D	Р	Р	D	D	D					
Ottoe skipper	Hesperia ottoe	prairies		S	D	Р	Р	D	D	D	D	D	Ν	D	Р	D
Hickory hairstreak	Satyrium caryaevorum	woodlands	Е	S	D	Р	Р	Р	Р	D	Р	Р	Р	Р	Р	D
Regal fritillary	Speyeria idalia	prairies		S	D	Р	Р	Р	D	Р	Р	Р	Р	Р	Р	Р
AMPHIBIANS AND REPTILES																
American toad	Bufo americanus	woodlands	Е		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Great Plains toad	Bufo cognatus	prairies	W		D	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Woodhouse's toad	Bufo woodhousii	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Western worm snake	Carphophis amoenus	woodlands		Т									Ν	Р	Р	Р
Prairie racerunner	Cnemidophorus sexlineatus	prairies	W					Р	Р	Р	Р	Р	Р	Р	Р	Р
Prairie rattlesnake	Crotalus viridis	prairies	W	E	D	D										
Great Plains skink	Eumeces obsoletus	prairies	W	E												D
Speckled kingsnake	Lampropeltis getulus	woodlands		Е												Р
Plains spadefoot	Scaphiopus bombifrons	prairies	W		D	P	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Massasauga	Sistrurus catenatus	wetland		E												D
Ornate box turtle	Terrapene ornate	prairies, edges		Т										D	Р	P

																Τ
BIRDS																†
Least Flycatcher	Empidonax minimus	woodland edges		S												
Bald Eagle	Haliaeetus leucocephalus	woodland		E*											D	
Kentucky Warbler	Oporornis formosus	woodlands	E													D
Summer Tanager	Piranga rubra	woodlands	E													D
Louisiana Waterthrush	Seiurus motacilla	woodlands	E													D
MAMMALS																
Southern flying squirrel	Glaucomys volans	woodlands	Е		Р	P		Р	Р	Р	Р	Р	Р	Р	Р	Р
Bobcat	Lynx rufus	woodlands		Е										D	D	
Woodland vole	Microtus pinetorum	woodlands	Е										Ν	Ν	D	D
Northern grasshopper mouse	Onychomys leucogaster	various		Т		Ν	Р	Р	D	Р	Ν					
Plains pocket mouse	Perognathus flavescens	prairies	W	Е	D	Р	Р	Р	D	D						
Southern bog lemming	Synaptomys cooperi	prairies	Е	S					Р	Р	Р	Р	Р	Р	Р	D
Eastern chipmunk	Tamias striatus	woodlands	E					Ν	D							
PLANTS																
White baneberry	Actaea pachypoda	woodlands	E													Р
Ohio buckeye	Aesculus glabra	woodlands	E					Р	Р	Р	Р	Р	Р	Р	Р	Р
Rock cress	Arabis shortii	woodlands	E					Р	Р	Р	Р	Р	Р			
American spikenard	Aralia racemosa	woodlands	Е		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Green dragon	Arisaema dracontium	woodlands	Е										Р	Р	Р	Р
Three-awned grass	Aristida purpurea	prairies	W		Р	Р	Р									
Eared milkweed	Asclepias engelmanniana	prairies	W	Е						D	Р	Р	Р	D		
Narrow-leaved milkweed	Asclepias stenophylla	prairies	W		Р	Р										
Paw paw	Asimina triloba	woodlands		S												D
Lotus milk vetch	Astragalus lotiflorus	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Missouri milk vetch	Astragalus missouriensis	prairies	W	S	D	Р	D	Р	Р							
Prairie moonwort	Botrychium campestre	prairie edge		S	D	D	Р	Р	D	Р	Р	Р	Р	Р	Р	Р
Blue grama	Bouteloua gracilis	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Bearded short-husk	Brachyelytrum erectum	woodlands	E					Р	Р	Р	Р	Р	Р	Р	Р	Р
Buffalo grass	Buchloe dactyloides	prairies	W		P	Р										
Rocky Mountain sedge	Carex saximontana	woodland edge	W	S	D	D	Р	Р	Р							
Blue cohosh	Caulophyllum thalictroides	woodlands	Е					Р	Р	Р		1				

Nodding thistle	Cirsium undulatum	prairies,		S												D
Spring beauty	Claytonia virginica	woodlands	E													Р
Stinking clover	Cleome serrulata	prairies	W		P	Р	P	Р	Р	Р	Р	Р	Р	Р	Р	Р
Fall coral-root	Corallorhiza odontorhiza	woodlands	Е							Ν	Р	Р	Р	Р	Р	D
Prairie tea	Croton monanthogynus	prairies		S					D	Р	Р					
Yellow lady's-slipper	Cypripedium calceolus	woodland	Е													Р
Nine-anther prairie clover	Dalea enneandra	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Bracted tick-trefoil	Desmodium cuspidatum	woodlands	Е													Р
Broad-leaved panic grass	Dichanthelium latifolium	woodlands	Е													Р
Yellow yam	Dioscorea villosa	woodlands	Е													Р
Purple coneflower	Echinacea angustifolia	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Mat spurge	Euphorbia stictospora	prairies	W				Р	Р	Р	Р	Р	Р	Р			
Showy orchis	Galearis spectabilis	woodlands	Е						Р	Р	Р	Р	Р	Р	Р	Р
Scarlet gaura	Gaura coccinea	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
American pennyroyal	Hedeoma pulgeoides	various														Р
Appendaged waterleaf	Hydrophyllum appendiculatum	woodlands	Е							Р	Р	Р	Р	Р	Р	Р
Dottted blazing star	Liatris punctata	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Michigan lily	Lilium michiganense	woodlands, prairies	E		P	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Stiff flax	Linum rigidum	prairies	W		Р	Р	P	Р	Р	P	Р	Р	Р	Р	Р	Р
Biscuitroot	Lomatium foeniculaceum	prairies	W	E												D
Skeletonweed	Lygodesmia juncea	prairies	W		Р	Р	P	Р	Р	P	Р	Р	Р	Р	Р	Р
Cut-leaved goldenrod	Machaeranthera spinulosa	prairies	W		Р	Р	P	Р	Р	P	Р	Р	Р	Р	Р	Р
Wild crab	Malus ioensis	woodlands, prairies	E					Р	Р	Р	Р	Р	Р	Р	Р	Р
Ten-petal blazing star	Mentzelia decapetala	prairies	W	S	D	Р	P	Р	Р	P	D	Р	Р	Р	Р	
Indian pipe	Monotropa uniflora	woodlands	Е													Р
Black-seeded rice-grass	Oryzopsis racemosa	woodlands	Е			D										
Locoweed	Oxytropis lambertii	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р
Ginseng	Panax quinquefolius	woodlands	Е										Р	Р	Р	D
Tall forked chickweed	Paronychia canadensis	woodlands	Е									Р	Р	Р	Р	Р
White beardtongue	Penstemon albidus	prairies	W	S	P	Р	Р	Р	Р							
Cobaea penstemon	Penstemon cobaea	prairies		S												Р
Slender beardtongue	Penstemon gracilis	prairies	W							Р	D					
Sycamore	Platanus occidentalis	woodlands	Е												Р	Р

Mayapple	Podophyllum peltatum	woodlands	Е													Р
Hairy mountain mint	Pycnanthemum pilosum	woodland edge	Е													Р
White oak	Quercus alba	woodlands	E										Р	Р	Р	Р
Hooked buttercup	Ranunculus recurvatus	woodlands	E		Р	Р	Р	Р	Р	Р	Р	Р	Р			
Tumblegrass	Schedonnardus paniculatus	prairies	W	S	D	D	Р	Р	Р	Р	D	Р				
Sensitive briar	Schrankia nuttallii	prairies		S									Р	Р	Р	Р
Silver buffaloberry	Shepherdia argentea	prairie edge	W	T	Р	Р	Р	Р	Р							
Zig-zag goldenrod	Solidago flexicaulis	woodlands	Е													Р
Scarlet globemallow	Sphaeralcea coccinea	prairies	W	T	D	Р	Р	Р	Р	D	D	Р	Р	D	Р	
Needle-and-thread grass	Stipa comata	prairies	W	S			Р	Р	Р	Р	D					
Green needlegrass	Stipa viridula	prairies	W		Р	Р	Р	Р	Р	Р	Р					
Rock elm	Ulmus thomasii	woodlands	Е					Р	Р	Р	Р	Р	Р	Р	Р	Р
Frost grape	Vitis vulpina	woodland edge		S										Р	Р	Р
Soapweed	Yucca glauca	prairies	W		Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р	Р

¹⁾ Affinity: **W**, Species with western affinities that reach their eastern range limits in far-western lowa. Some of these are isolated from their centers of population far to the west. **E**, Eastern species near the western edge of their distribution range in the Loess Hills.

²⁾ Official lowa Status: **E**, endangered; **T**, threatened; **S**, special concern. Note: "Endangered" is defined as "likely to become extinct in the state in the foreseeable future". "Threatened" means "likely to become endangered in the state in the foreseeable future." "Special Concern" means suspected to be rare or declining in the state, but more information is needed to assess the status of these species.

³⁾ Special Landscape Areas (as described in appendix D): **D**, species documented within Landscape; **N**, species documented nearby Landscape; **P**, species predicted to occur in general vicinity of Landscape

^{*} The Bald Eagle is federally listed as Threatened in the lower 48 states.